Arsan®

Precise Connections - since 1957

AR-EX EXPANSION JOINTS

AR-EX EXPANSION JOINTS

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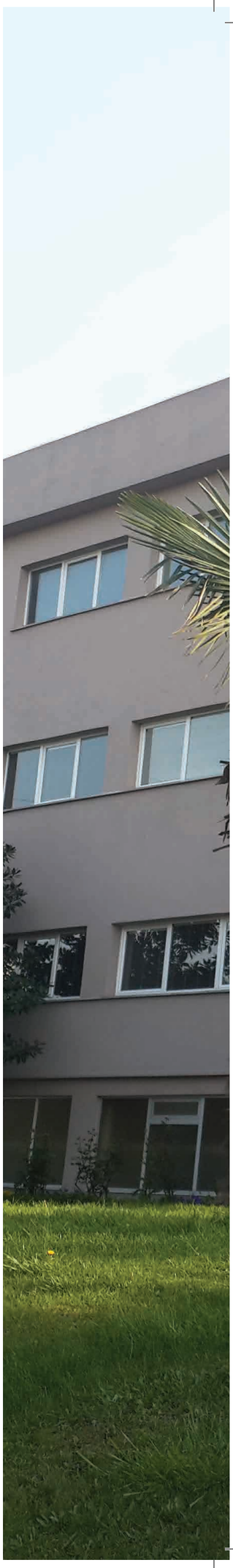


Arsan is a leading manufacturer in Structural/Seismic Bearings, Structural/Seismic Expansion Joints and Pipe/Segment Gaskets Sectors and it continues to grow via its policy focused on continuous improvement since 1957.

Arsan is located in Istanbul Dudullu Industrial Zone, running at 10.000 m2 closed Area which will increase upto 35000 sqm by the end of 2018 via ongoing investment, more than 200 employees are working for Arsan.

60% of its total production is exported and 85% of this turnover is generated from Europe. In addition to these European countries Arsan exports to more then 30 other countries as well.

Arsan is able to develop products according to the drawings and specifications of clients, as well as international standards, thanks to its experienced R&D team. Thus, Arsan is a reliable solution partner of the outperforming construction companies with these capabilities.

Various production methods are used at Arsan Kauçuk, such as extrusion, compression and injection. Moulds needed for different products are designed and manufactured in our factory by the talented engineers. Moreover, our laboratory is equipped with testing devices of up to date technology and products are controlled at every stage of production.


Arsan Kauçuk®

AR-EX Bridge Expansion Joints

Structure, Performance and Installation Method of Expansion Joint Devices

HS-C type, HS-Z type, HS-L type and HMD type modular pattern road and bridge expansion joint devices are the bridge expansion joint devices designed with profiled bars and integrally shaped through hot rolling.

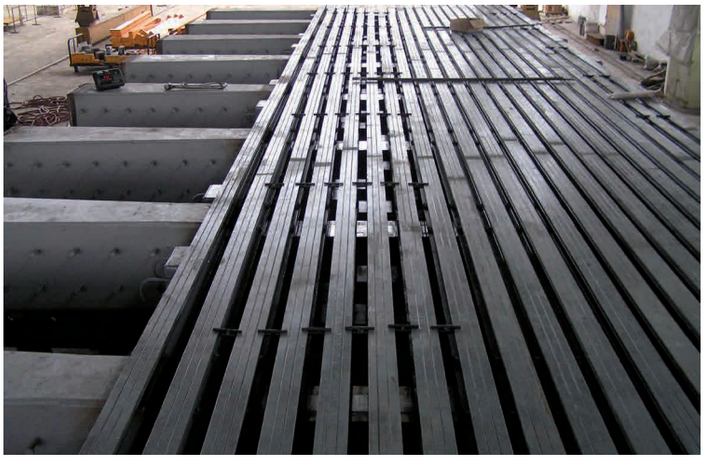
HS-C type, HS-Z type and HS-L type expansion joint devices are applicable to bridge joints with expansion amount below 80mm. HMD expansion devices are modular pattern bridge expansion devices composed of boundary beam, middle beam, cross beam and linking mechanism and are applicable to large-span bridges with expansion amount as 80mm~1200mm.

1. Technical conditions of design and manufacture

1) Design load: Design by adopting truck loads—according to AASHTO LRFD;
2) The profile bar used in this structure is S355 special steel for bridges. The tensile strength of steel is not less than 480MPa and allowable flexural stress is not less than 210MPa;
3) In the structure, supporting cross beam is made of S355, with allowable flexural stress not less than 210MPa;
4) Steel of other accessories could be made of steels with the strength nor less than S235

2. Structural characteristics

The outstanding characteristics of HMD type expansion joint device is the bearing structure and displacement control system are separated and the load bearing of the two systems are clearly divided without any interference. In this way, both safety and uniform displacement during load can be ensured.



3. Determination of expansion amount of expansion joint devices

The calculation value of bridge expansion amount will directly influence the selection of the specification of expansion joint devices. Inappropriate selection will directly affect the use effect of expansion joint devices. Meanwhile, the amount of clearance of expansion joint device between beams and slabs shall also be taken into consideration durign selection so as to ensue the anchoring between expansion joint device and both end of beam and slab is sufficient and the best use effect is anchieved.

Thus, when selecting the specification of expansion joint devices, sufficient surplus must be reserved so as to ensure the use effect and durability of expansion joint devices.

4. Transportation, storage and installation of expansion joint devices

Transportation

Expansion joint devices shall be transported to construction site by the manufacturer or user after assembled according to design requriment. Fabrication in sections method could be used in case its length exceeds the allowable limit of transportation or it cannot be transported as a whole unit due to other reasons.

Storage

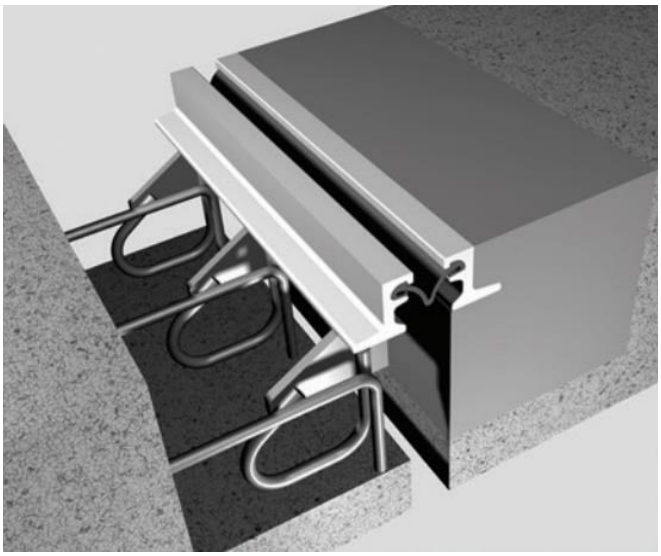
After transported to construction site, expansion joint devices shall be stored at the place as close as possible to the installation position, and be placed on the upholder at least 30cm from the ground.

Installation

Expansion joint devices of the same quality can have obvious difference in terms of use effect and durability due to different installation quality. After investigation and research, we fully proved the construction and installation quality of expansion joint devices is the last key link to ensure the use effect of expansion joint devices.

AR-EX BRIDGE EXPANSION JOINTS

♦ AR-EX HS — SINGLE GAP EXPANSION JOINTS



Arsan AR-EX HS single gap expansion joint consists of two steel profiles with anchor loops and a replaceable and %100 watertight seal.

AR-EX HS-80 and AR-EX HS-100 joint allows for a total movement of up to 80 mm and 100 mm.

Arsan special sealing profiles allow to arrange the maximum movement of single gap expansion joints up to 200 mm according to project requirements.

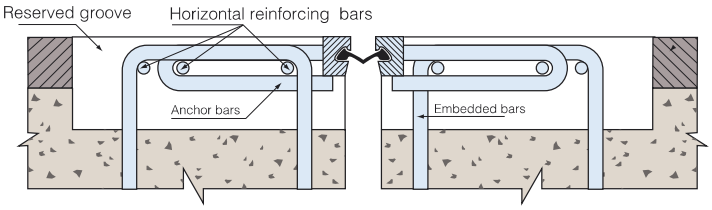
AR-EX HS Single Gap Expansion Joints are suitable both for asphalt and concrete road surfaces.

Expansion joint type selection depends on the bridge structure. The chosen expansion joint type must be able to facilitate all movements in all directions and rotations.

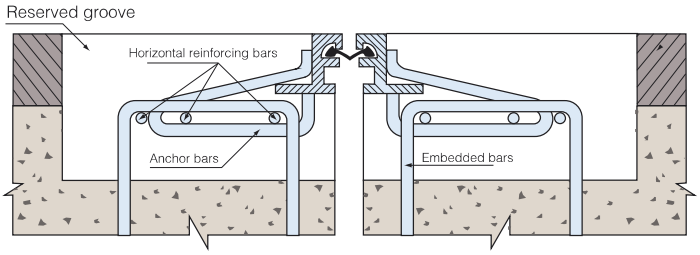
The ability of an expansion joint to prevent leakage of surface water to the structure beneath is a critical factor to avoid serious damage to the bridge support system.

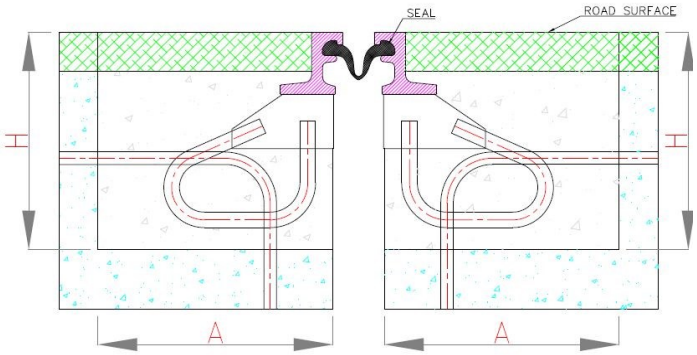
Single gap expansion joints are commonly used expansion joints for movements of 100 mm or less. Short span bridge decks do not experience large changes in length due to temperature changes etc.

Elevation of C type



Elevation of Z type





Cross Section of AR-EX HS

Type	Max. Longitudinal Movement (mm)	Max. Transverse Movement (mm)	A (mm)	H (mm)
HS-80	80	+/- 40	300	280
HS-100	100	+/- 50	300	280

AR-EX BRIDGE EXPANSION JOINTS

♦ AR-EX HS — SINGLE GAP EXPANSION JOINTS

Watertightness

Arsan HS Rubber Strip Seal is effectively placed in the grooves of the edge beams without using any screwed or bolted connections.

Screwless connection of seal is for easy and quick replacement. For maintenance, it can be easily replaced and inserted from the top of the road surface with simple tools.

Arsan rubber seal design ensures %100 watertightness with tests. Sealing elements are in EPDM or CR material.

Rubber seal between steel beams consists of elastomeric sealing element with special shape.

Watertight rubber seal is protected from the heavy traffic by the edge beams and its shape maintains the joint gap free of dirt.

Fabrication of AR-EX HS

Fabrication of AR-EX HS—Before Painting

Considering all factors which should be taken into account when selecting and detailing a small movement joints, consisting of steel edge profiles and a durable elastomeric strip seal, single gap expansion joints offer effective solution.

Anchorage Welding of AR-EX HS

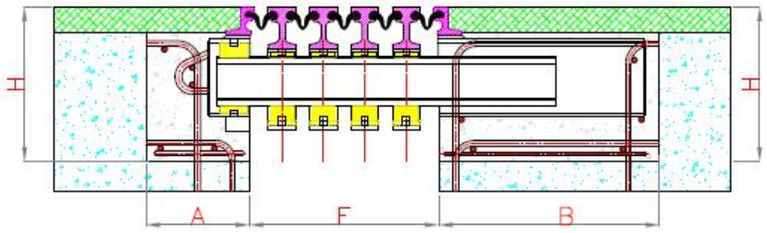
Fabrication—Anchorage

The edge beams are rigidly connected to the main structure by means of anchors directly welded to the edge beams.

Anchorages are embedded into the bridge slab reinforcement to assure the traffic force resistance. Bolted or screwed connections are not allowed in the carriageway surface directly exposed to permanent traffic loading.

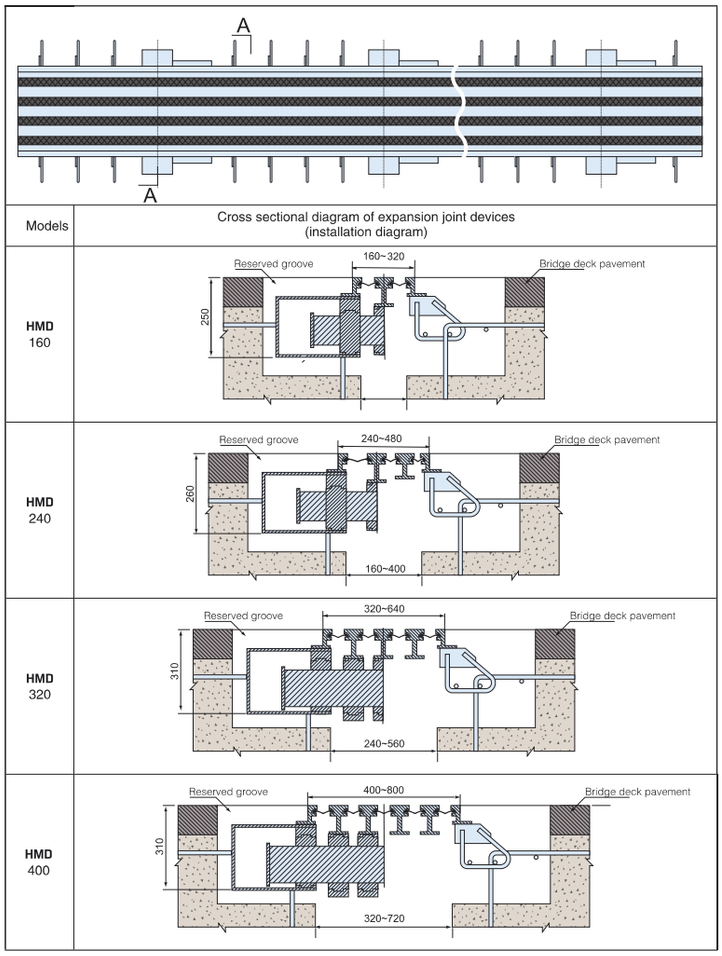
Installation of AR-EX HS

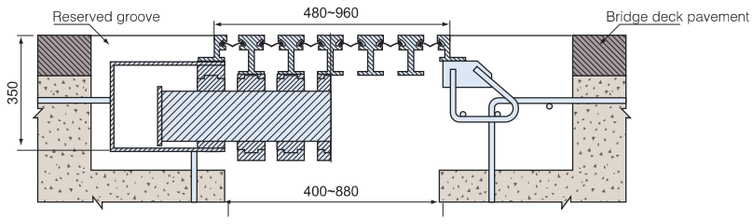
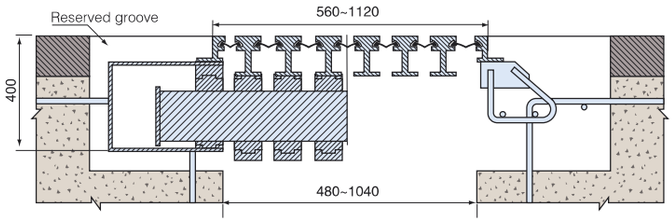
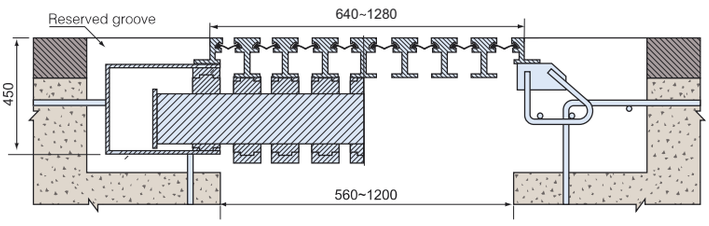
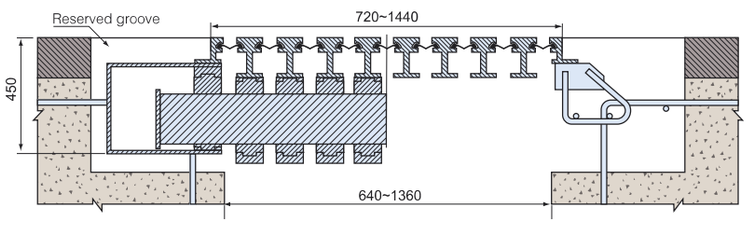
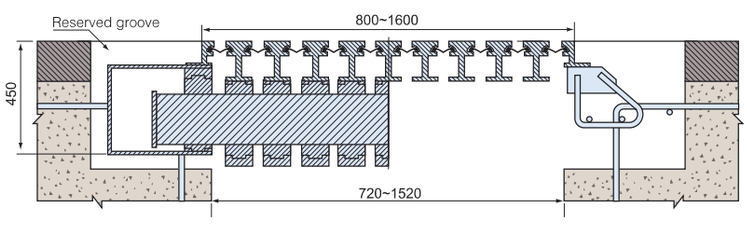
♦ AR-EX HMD — MODULAR EXPANSION JOINTS

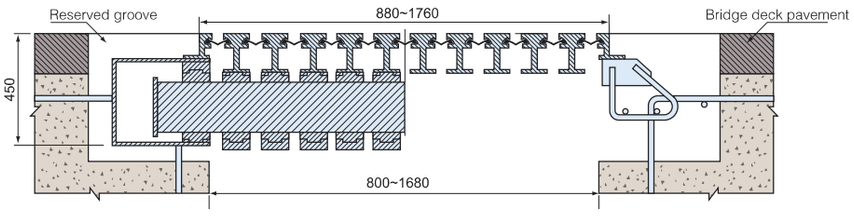
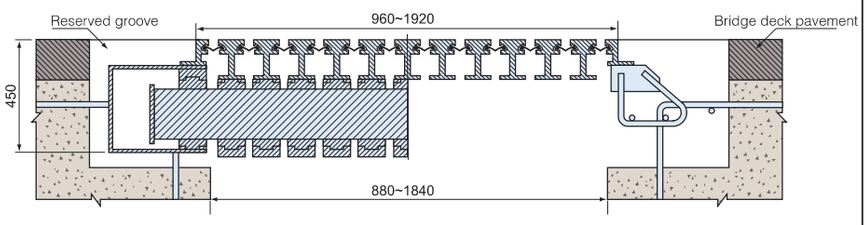
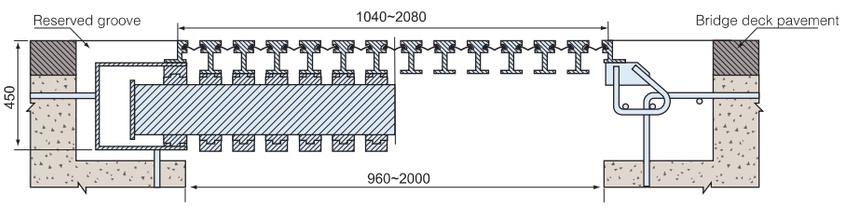
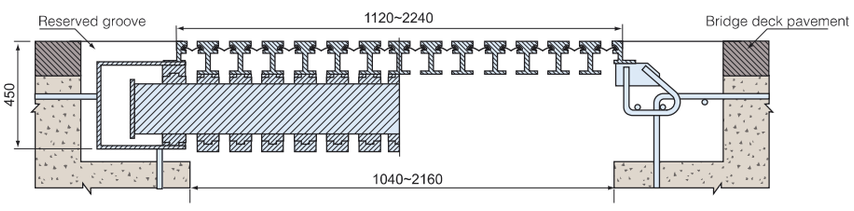
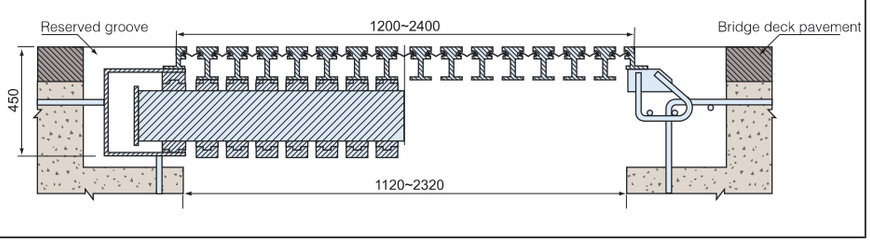


Type	Max. Longitudinal Movement (mm)	Max. Transverse Movement (mm)	A_{min} (mm)	B_{min} (mm)	F_{min} (mm)	F_{max} (mm)	H_{min} (mm)
HMD-160	160	+/- 80	300	300	160	320	300
HMD-240	240	+/- 120	300	480	240	480	300
HMD-320	320	+/- 160	300	560	320	640	350
HMD-400	400	+/- 200	300	640	400	800	350
HMD-480	480	+/- 240	300	720	480	960	400
HMD-560	560	+/- 280	300	800	560	1120	450
HMD-640	640	+/- 320	300	880	640	1280	500
HMD-720	720	+/- 360	300	960	720	1440	500
HMD-800	800	+/- 400	300	1040	800	1600	500
HMD-880	880	+/- 440	300	1120	880	1760	500
HMD-960	960	+/- 480	300	1200	960	1920	500
HMD-1040	1040	+/- 520	300	1280	1040	2080	500
HMD-1120	1120	+/- 560	300	1360	1120	2240	500
HMD-1200	1200	+/- 600	300	1440	1200	2400	500

Diagram of overall dimension and installation of various specifications ranging from 160mm to 1200mm



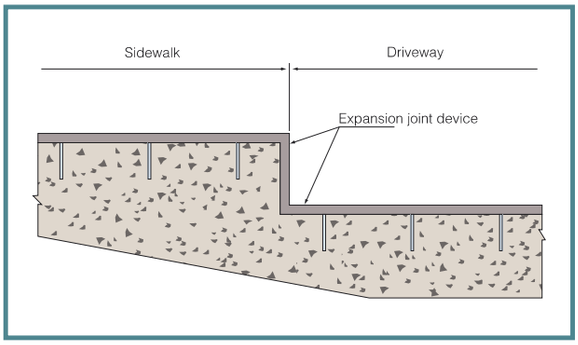
Model	Sectional view of the telescopic device (Installation schematic)
HMD 480	
HMD 560	
HMD 640	
HMD 720	
HMD 800	

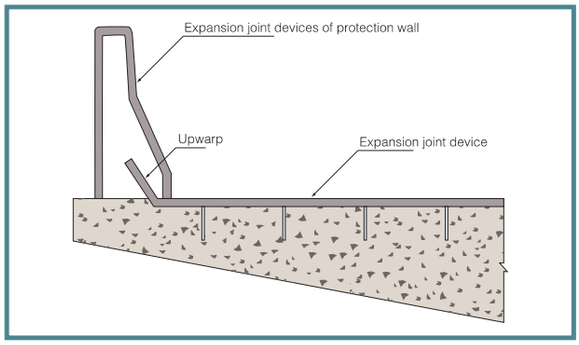
Model	Sectional view of the telescopic device (Installation schematic)
HMD 880	
HMD 960	
HMD 1040	
HMD 1120	
HMD 1200	

Waterproof Treatment of Sidewalk, Protection Wall and The End of Expansion Joint Device

In order to adapt to the transaction between sidewalk and driveway, our company could fabricate the expansion joint device conformable to the pavement in accordance with the drawing provided by the user, as shown below.

In order to prevent the accumulated water in rubber sealing strip from flowing to the abutment, upward could be set on both ends of expansion joint devices. The upward of expansion joint devices could be designed to different forms according to different pavement (upward length and angle). Generally, upward is placed the protection wall, as shown below.





Installation of AR-EX Expansion Joints

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